April 19, 2004

Mr. Rod Krich, Vice President
Licensing, Safety, and Nuclear Engineering
Louisiana Energy Services
2600 Virginia Avenue NW, Suite 610
Washington, DC 20037

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION ON LOUISIANA ENERGY SERVICES PROJECT LICENSE APPLICATION

Dear Mr. Krich:

We have completed the initial technical review of your license application for a gas centrifuge enrichment facility proposed to be constructed in Eunice, New Mexico. Your application was submitted on December 12, 2003.

Our technical review identified the need for additional information or clarifications as indicated in the attachment. Please submit responses to the requests for additional information within 30 days of this letter.

If you have any questions, please contact me at 301-415-7299.

Sincerely,

/RA/

Timothy C. Johnson, Project Manager
Gas Centrifuge Facility Licensing Section
Special Projects Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Enclosure: Requests for Additional Information

Docket No. 70-3103

cc: William Szymanski/DOE
James Curtiss/W&S
Peter Miner/USEC
James Ferland/LES
Dennis Holmberg/Lea County
James Brown/Eunice
Monty Newman/Hobbs
Michael Marriotte/NIRS
Lee Cheney/CNIC
Claydean Claiborne/Jal
Troy Harris/Lovington
Betty Rickman/Tatum
Glen Hackler/Andrews
William Floyd/New Mexico
Richard Ratliff/Texas
Jerry Clift/Hartsville
Derrith Watchman-Moore/New Mexico

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DMcIntyre/OPA	MGalloway	JHenson/Reg II	SLewis/OGC
DAyres/Reg II	DSeymour/Reg II	RHannah/Reg II	KClark/Reg II
RTrojanowski/Reg II	KO'Brien/Reg III	VMitlyng/Reg III	WMaier/Reg IV
WTRoskowski	RWescott	FBurrows	DBrown
JKlein	HFlesher	WSmith	JKramer/RES
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OFC	SPB*		SPB*		SPB		OGC*		SPB	
NAME	TJohnson/dw		LGross		BSmith		LClark		JGiitter	
DATE	4/ 15/04		4/ 16/04		4/ 19 /04		4/ 19 /04		4/19 /04	

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Louisiana Energy Services Gas Centrifuge Uranium Enrichment Plant
Requests for Additional Information

Chapter 1.0 General Information

GI-1 Section 1.2.1.2, pp. 1.2-1 and 1.2-2

Provide a copy of the LES Partnership Agreement.

Regulations in 10 CFR 70.22(a)(1) require the applicant to provide the corporate name of the applicant and the name of the State where it is incorporated or organized.

The applicant provided general information on the partnership structure. However, information on the financing and partnership control responsibilities needs to be provided.

GI-2 Section 1.2.1.2, 1st Para., p. 1.2-1

Provide the name of the LES subsidiary formed for the purpose of purchasing the Lea County Industrial Revenue Bonds and the name of the State where it is incorporated or organized. Also, provide a copy of the Industrial Revenue Bond agreement with Lea County.

Regulations in 10 CFR 70.22(a)(1) require the applicant to provide the corporate name of the applicant and the name of the State where it is incorporated or organized.

LES indicated that it has a wholly-owned subsidiary for the purpose of purchasing Industrial Revenue Bonds issued by Lea County, but did not provide its name or State of incorporation or organization. In addition, the Industrial Revenue Bond agreement needs to be provided to verify the licensing responsibilities of the applicant and Lea County.

GI-3 Section 1.2.2, p. 1.2-3

Provide a detailed estimate of the cost to construct the plant.

The regulations in 10 CFR 70.22 provide that where the nature of the proposed activities requires consideration of the applicant's financial qualifications, the Commission may request information with respect to financial qualifications.

The applicant estimated the cost to construct the plant at approximately $1.2 billion in 2002 dollars. The applicant stated that this estimate is the cost to design and construct the facility, and the estimate excluded escalation, a contingency, interest, and any replacement equipment that may be needed during the life of the plant. The application did not provide a detailed basis that supported the $1.2 billion estimate. Because the NRC must make a finding in accordance with 10 CFR 70.23(a)(5), regarding whether the applicant appears to be financially qualified to engage in the purposed activities, the staff will need to review the supporting basis for the $1.2 billion estimate. The validity of the estimated cost, with its supporting assumptions is a key factor in determining if the applicant is financially qualified. LES should submit a detailed estimate of the cost to construct the plant.

GI-4 Section 1.2.2, p. 1.2-4

Provide the amount of public liability insurance to be provided and the basis for the amount proposed.

Under the regulations in 10 CFR 140.13b, a licensee of a uranium enrichment facility must have and maintain liability insurance.

In the application, the applicant indicated that when the plant is ready for operation it will obtain liability insurance coverage to closely approximate the $300 million limit. The applicant needs to provide the amount of coverage it will obtain to meet the requirements in 10 CFR 140.13b. In addition, the regulations require that the liability insurance be obtained prior to issuing the license, not prior to operations.

GI-5 Section 1.2.3, p. 1.2-4

Provide possession limits for all proposed licensed material in terms of total quantity to be possessed.

Regulations in 10 CFR 70.22(a)(4) require an applicant to identify the name, amount, and specifications of the material proposed for use.

The applicant in Table 1.2-1 provides information on the types of material proposed for use in average annual quantities. The applicant should provide total quantities of licensed material to be possessed. In addition, any other licensed material, including potential sources of contamination in UF_6, such as Tc-99, and any calibration sources proposed to be used should be identified and quantity limits proposed.

Chapter 2.0 Organization and Administration

OA-1 Section 2.1.1, p. 2.1-1 and Figures 2-1 and 2-2

Clarify the organization charts for the design and construction organization and the operating organization.

10 CFR 70.22(a)(6) requires the technical qualifications, including training and experience, of the applicant and staff to engage in the proposed activities.

Figure 2.1-1 provides a diagram of the proposed organization for design and construction. Figure 2.1-2 provides a diagram of the organization for operations. However, the references in Figure 2.1-1 to Figure 2.1-2 are confusing and appear to duplicate some positions (e.g., Health, Safety, and Environment Manager).

OA-2 Sections 2.2.1, p. 2.2-2 & p. 2.2-4; 2.2.4, pgs. 2.2-9 - 2.2-10; 5.1.5,pgs. 5.1-4 - 5.1-5; and Emergency Plan Section 4.1, p. 4.1-2 & p. 4.1-4

Clarify the positions and responsibilities of the Health, Safety, and Environmental Manager, Criticality Manager, Criticality Safety Engineer, and Nuclear Criticality Engineer.

10 CFR 70.22(a)(6) requires the technical qualifications, including training and experience, of the applicant and staff to engage in the proposed activities.

Sections 2.2.1 and 2.2.4 identify the operating organization and personnel qualification requirements, including those for the Health, Safety, and Environment Manager and Criticality Safety Engineer. Section 5.1.5 identifies relevant Nuclear Criticality Safety staff, including a Nuclear Criticality Manager and a Nuclear Criticality Engineer that are not described in Section 2.2.1 and 2.2.4. Also, the responsibilities described in Chapter 2.0, Chapter 5.0, and the Emergency Plan for the same positions are different.

OA-3 Sections 2.2.1, p. 2.2-2; and 2.2.4, p. 2.2-4

Provide the qualifications of individuals that may be designated to (1) review and approve changes to the facility or activities of personnel that require NRC approval prior to making the change, in place of the Health, Safety and Environment Manager and (2) review and approve changes to the facility or to operations that involve chemical, radiation hazard, or criticality considerations prior to making the change, in place of the Health, Safety, and Environmental Manager.

10 CFR 70.22(a)(6) requires the technical qualifications, including training and experience, of the applicant and staff to engage in the proposed activities.

Section 2.2.1.E refers to “designees” that have approval authority in place of the Health, Safety, and Environmental Manager. However, there needs to be a discussion of the qualification requirements for these individuals in either Section 2.2.1 or Section 2.2.4.

OA-4 Section 2.2.1, 2.2.4, and 5.1.5, General

Clarify which position(s) will be responsible for the NCS management and NCS supervision activities described in ANS-8.19, “Administrative Practices for NCS” and provide this information in either Section 2.2.3 or Section 5.1.5.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application.

Sections 2.2.1, 2.2.4, and 5.1.5 need to clearly describe which individual has responsibility for different elements of the NCS program. It is unclear if the Health, Safety, and Environment Manager has responsibilities for both NCS management and NCS supervision as well as what the phrase “administration of NCS reviews” means. It is unclear if the Criticality Safety Engineer has responsibilities for both NCS supervision and NCS staff. Also, it is unclear whether a Criticality Safety Engineer will be onsite during all shift operations, and, if not,

whether a Criticality Safety Engineer will be able to effectively respond to emergency conditions.

Chapter 3.0 Integrated Safety Analysis Summary

ISA-1 Chapter 3.0, General

Clarify the separation between the Integrated Safety Analysis (ISA) Summary, which does not need to be incorporated into the license, and the programmatic commitments related to the ISA and ISA Summary that are required to be in the application.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application. 10 CFR 70.65(b) requires the ISA Summary to be submitted with the license application, but shall not be incorporated into the license.

It is unclear what part of Chapter 3.0 are the programmatic commitments for the ISA and ISA Summary as well as descriptions of how to meet those commitments that are needed to meet 10 CFR 70.62(a) and 70.65(a) versus what part of Chapter 3.0 is the ISA Summary that is needed to meet 10 CFR 70.65(b).

ISA-2 Sections 3.0, 3.1.1, 3.1.1.1, 3.1.5, 5.1.6, 5.2, 5.3, and Emergency Plan Section 4.1, General

Clarify the different terminology used for NCS documents and provide the purpose, use, content, and relationships between the documents in Chapter 5.0.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application.

Throughout the application, there are different terms used for NCS documents, such as: NCS analyses, NCS assessments, NCS determinations, NCS evaluations, criticality safety analyses, criticality safety assessments, criticality safety evaluations, criticality evaluations, criticality assessments, and criticality evaluations. It is unclear if these documents have different purposes, uses, and content. It is unclear how each document relates to the others.

One example is the use of NCS Determinations. Section 3.1.5 describes one purpose (i.e., "NCS Determinations are specialized studies that assure the risk of having a criticality accident is highly unlikely, and that the double contingency principle is satisfied."); Section 5.2.1.3 describes a different purpose (i.e., "The NCS Determinations presented in Section 5.3 provide values of k-eff to conservatively meet the USL."); and, during the site visit to Massachusetts in March 2004, applicant staff indicated a third purpose and applied in a way during the ISA process not described in the application (i.e., NCS Determinations were unclassified summaries of the four basic applicant NCS documents - three bounding NCS evaluations and a critical dimensions document).

ISA-3 Sections 3.1.1, p. 3.1-1 and Chapter 3.0, General

Clarify whether the statement in Section 3.1.1, "The approach used for performing the ISA is consistent with Example Procedure for Accident Sequence Evaluation, Appendix A to Chapter 3.0 of NUREG-1520 (NRC, 2002)" was intended to mean a commitment to follow the example in the NUREG.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61.

For example, Tables 3.1-7, 3.1-8, 3.1-9, 3.1-10, and 3.1-11 are essentially the same as those in Appendix A to Chapter 3.0 of NUREG-1520, Tables A-4, A-8, A-9, A-10, and A-11, respectively. However, it is unclear if the tables were used properly because the descriptions of the tables in the ISA Summary did not include all the accompanying text from NUREG-1520 that describes how the tables should be used.

ISA-4 Section 3.1.1.1, p. 3.1-2

Clarify the differences in the terminology "normal and bounding conditions" and "normal and credible abnormal conditions."

10 CFR 70.61(d) requires that the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical.

In Section 3.1.1.1 the applicant described a process used for evaluating normal and bounding conditions, but there needs to be an explanation of how the "bounding conditions" relate to "credible abnormal conditions" to meet the regulations.

ISA-5 Sections 3.1.5 and 5.2.1.3, General

Clarify the approach used to meet the performance requirements of 10 CFR 70.61 and the associated regulations for NCS and provide this information in the ISA Summary.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application. 10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61.

It is unclear what approach was used to meet the performance requirements of 10 CFR 70.61 for NCS. Examples include: (1) Section 3.1.5 indicates that the NCS Determinations were used in some manner and (2) Section 3.8.1 indicates that an alternative process was sometimes used.

ISA-6 Section 3.1.5 and 5.5

Clarify the information about the Criticality Accident Alarm Systems (CAAS).

10 CFR 70.22(a)(7) requires a description of equipment and facilities which will be used by the applicant to protect health and minimize danger to life or property (such as criticality accident

alarm systems). 10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61. 10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application. 10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61, including the requirements for criticality monitoring and alarms in 10 CFR 70.24.

It appears that not all the information in Section 3.1.5 is appropriate (i.e., it is not about CAAS). It appears that some of the information in Section 5.5 is appropriate for the ISA Summary (e.g., figures and text regarding the figures). For guidance only, see NUREG-1520, Section 5.4.3.4.3.

ISA-7 Section 3.1.7, page 3.1-16

Provide a discussion of how Items Relied on for Safety (IROFS) are protected from environmental conditions and dynamic effects and how the requirements of 10 CFR 70.64(a)(4) are met for individual IROFS. The discussion should consider appropriate industry standards. Also, discuss how non-IROFS will be able to withstand environmental stress caused by environmental and dynamic service conditions under which their failure could prevent satisfactory accomplishment of safety functions by IROFS. Provide information on the facility's essential utility services (if any) and how the design provides for their continued operation.

The regulations, 10 CFR 70.64(a), require that the applicant address the baseline design criteria. Specifically, 10 CFR 70.64(a)(4) requires that the design must provide for adequate protection from environmental conditions and dynamic effects associated with normal operations, maintenance, testing, and postulated accidents that could lead to loss of safety functions. Also 10 CFR 70.64(a)(7) requires that the design must provide for continued operation of essential utility services.

Section 3.1.7.D of the application stated that "Structures, systems, and components that are determined to have safety significance (IROFS) are protected against dynamic effects of missiles and discharging fluids, that may result from natural phenomena, accidents at nearby industrial, military, or transportation facilities, equipment failure, and other similar events and conditions both inside and outside the facility." Since this statement does not indicate how IROFS are protected from environmental conditions and dynamic effects, provide a discussion of how the requirements of 10 CFR 70.64(a)(4) are met for individual IROFS. The discussion should consider appropriate industry standards. Also, discuss how non-IROFS will be able to withstand environmental stress caused by environmental and dynamic service conditions under which their failure could prevent satisfactory accomplishment of safety functions by IROFS.

Section 3.1.7.G of the Safety Analysis Report stated that "On site utility service systems required to support IROFS shall be provided. Each utility service system required to support IROFS shall provide for the meeting of safety demands under normal and abnormal conditions." Since this statement does not identify the facility's essential utility services (if any) and does not discuss how the design provides for their continued operation, provide this information.

ISA-8 Section 3.1.7-I, p. 3.1-17; 3.8.1, p. 3.8-2; 5.1.1, p. 5.1-1; and 5.7, p. 5.7-1

Clarify the commitments to double contingency principle, double contingency protection, as well as clarify the quote from the ANS-8.1 standard regarding the double contingency principle.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application. 10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61. 10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the requirements of 10 CFR 70.64(a)(9).

There needs to be clear and consistent commitments to the double contingency principle and double contingency protection throughout Chapter 3.0 and Chapter 5.0.

Examples of inconsistency include: Section 3.1.7-I states that, "All process and storage systems shall be designed to be maintained subcritical and to ensure that no nuclear criticality accident can occur unless at least two unlikely, independent, and concurrent changes have occurred in the conditions essential to nuclear criticality safety." Section 3.8.1 states that, "For accident sequences postulated to result in nuclear criticality, the double contingency protection requirement is satisfied by IROFS and multiple independent controls on a single process parameter." Section 5.1.1 states that, "The adopted double contingency principle states 'process designs shall incorporate sufficient factors of safety to require at least two unlikely, independent, and concurrent changes in process conditions before a criticality accident is possible.'" Section 5.1.1 states that "In the current design, each process that has accident sequences that could result in an inadvertent nuclear criticality at the [facility] will have double contingency protection." Section 5.7 states that, "The double contingency principle will be used in determining NCS controls and IROFS in the design of new facilities or new processes..."During the onsite visit in Massachusetts in March 2004, applicant staff indicated that for the initial design of the facility, the commitment is to the double contingency principle, as described in Section 5.1.1 and then afterwards, the commitment is to the double contingency protection, as described in Section 5.3.16.

Also, the reference to the double contingency principle from the ANS-8.1 standard, "NCS in Operations with Fissionable Materials Outside Reactors" needs to be changed to reflect that it is a different statement from that in the standard.

ISA-9 Section 3.2.6.1, pp. 3.2-23 through 3.2-29

Provide results of investigations conducted to identify any capable faults within a 322-km [200-mi] radius. Page 3.2-23 of the Safety Analysis Report states, "No Quaternary faults are mapped for the site locale. The nearest recent faulting is situated more than 161 km [100 mi] west of the site." It is not clear if any of these faults are capable.

Under 10 CFR 70.62(c)(iv), an applicant is required to address potential accident sequences caused by external events, including natural phenomena. The Standard Review Plan, NUREG-1520, on page 3-12, (1)c, states that characterization of natural phenomena (e.g., tornadoes, hurricanes, floods, and earthquakes) and other external events is needed to assess their impact on facility safety and to assess their likelihood of occurrence.

Based on the information provided, the staff is unable to determine if the faults cited are capable.

ISA-10 Section 3.2.6.1, pp. 3.2-23 and 3.2-24

Include in Tables 3.2-20 and 3.2-21 of the Safety Analysis Report focal depths and distances to site for all events greater than magnitude 3. Also, include all available magnitude designations (i.e., m_b, M_L, M_s, and M_w).

Under 10 CFR 70.62(c)(iv), an applicant is required to address potential accident sequences caused by external events, including natural phenomena. The Standard Review Plan, NUREG-1520, on page 3-12, (1)c, states that characterization of natural phenomena (e.g., tornadoes, hurricanes, floods, and earthquakes) and other external events is needed sufficient to assess their impact on facility safety and to assess their likelihood of occurrence.

The earthquake focal depths and distances to site for all earthquake events greater than magnitude 3 and the appropriate magnitude designations are needed to appropriately consider the potential effect of earthquake events.

ISA-11 Section 3.2.6.2, pp. 3.2-24 and 3.2-25

Explain how seismic source regions for the site are determined on the basis of the earthquake frequency pattern shown on Figure 3.2-21. Specifically, explain how the spatial density was calculated and provide the appropriate units on the legend of Figure 3.2-21.

Under 10 CFR 70.62(c)(iv), an applicant is required to address potential accident sequences caused by external events, including natural phenomena. The Standard Review Plan, NUREG-1520, on page 3-12, (1)c, states that characterization of natural phenomena (e.g., tornadoes, hurricanes, floods, and earthquakes) and other external events is needed to assess their impact on facility safety and to assess their likelihood of occurrence.

The requested information is needed to correctly read the contours shown on Figure 3.2-21.

ISA-12 Section 3.2.6.4, pp. 3.2-26 through 3.2-28

Discuss the possible effects caused by human activities such as withdrawal of fluid from or addition of fluid to the subsurface on the evaluation of tectonic structures underlying the site and the region surrounding the site. If possible, identify the seismic events related to gas and oil recovery methods in the vicinity of the site, including the magnitudes and locations of these events and the effects on the recurrence models if these events are removed.

Under 10 CFR 70.62(c)(iv), an applicant is required to address potential accident sequences caused by external events, including natural phenomena. The Standard Review Plan, NUREG-1520, on page 3-12, (1)c, states that characterization of natural phenomena (e.g., tornadoes, hurricanes, floods, and earthquakes) and other external events is needed sufficient to assess their impact on facility safety and to assess their likelihood of occurrence.

As stated in Section 3.4.3.2.(1)c of the Standard Review Plan, the applicant should assess which events could occur without adversely impacting safety. The staff requests that the applicant provide a discussion of possible effects caused by human activities such as withdrawal of fluid from or addition of fluid to the subsurface.

ISA-13 Section 3.2.6.5, p. 3.2-29

Describe the design safety margins, structural elasticity and conservatism needed to demonstrate that use of a 10,000 year (1.0 E-4) earthquake in the detailed design process can achieve a performance level of less than about 1.0 E-5 for seismic IROFS.

10 CFR 70.64(a)(2), Natural Phenomena Hazards, requires that the design must provide for adequate protection against natural phenomena with consideration of the most severe documented historical events for the site. 10 CFR 70.61(b) requires that the risk of each credible high consequence event must be limited. High consequence events are those internally or externally (i.e., seismic) initiated events that result in specified chemical and/or radiological exposures.

Section 3.2.6.5, Selection of the Design Basis Earthquake, identifies a 10,000 year return earthquake as the design basis earthquake (DBE) to be used in the detailed design process to demonstrate compliance with the overall ISA performance requirements. Confirmatory seismic performance calculations for the seismic IROFS will be performed to demonstrate that use of the DBE will achieve a likelihood of unacceptable performance of less than approximately 1.0 E-5. The difference between the mean annual probabilities for design (1.0 E-4) and performance (1.0 E-5) is achieved through conservatism in the design (factors of safety), elasticity in the structures, and conservatism in the evaluation of the design.

ISA-14 Section 3.3.1.2.2.18, p. 3.3-8; Section 3.5.7, pp. 3.5-40 and 3.5-41; Section 3.5.9.2.1, pp. 3.5.44 and 3.5.45; and Section 5.5. p. 5.5-1

Describe the process used to conduct the human factors engineering review of the Control Room, the Communication and Alarm Annunciation System, the Central Control Room, and the Criticality Accident Alarm System as it applies to IROFS requiring operator actions.

The regulations in 10 CFR 70.61 and 70.62 require that an applicant perform an integrated safety analysis of the hazards associated with the proposed facility and demonstrate compliance with the performance requirements in 10 CFR 70.61(b), (c), and (d).

The applicant describes the Control Room in Section 3.3.1.2.2.18, the Central Control System in Section 3.5.9.2.1, the Communication and Alarm Annunciation System in Section 3.5.7, and the Criticality Accident Alarm System in Section 5.5. For those IROFS functions requiring operator actions, the applicant should describe the process used to conduct the human factors engineering review of these areas, and for any other safety - significant human-system interfaces located outside the areas. NUREG-0711, Rev. 1, “Human Factors Engineering Program Review Model,” dated 2004, and NUREG-0700, Rev. 2, “Human-System Interface Design Review Guidelines,” dated 2004, are sources that can be used to conduct this review, adjusted as appropriate for the facility ISA. Operating experience with these systems at similar Urenco enrichment facilities in Europe may also be used to conduct this review to give NRC review staff additional confidence that the facility will meet the performance requirements in 10 CFR 70.61.

ISA-15 Section 3.3.2.2.6.2, p. 3.2-28

The application states, “Rainfall loadings on roofs and other exposed surfaces result from two different events. The first event is normal heavy rainfall having a 100-year return period.” Provide information about the rainfall with a 100-year return period, including amount and

duration. Also, provide the technical basis on how this 100-year return period rainfall was determined.

Under 10 CFR 70.62(c)(iv), an applicant is required to address potential accident sequences caused by external events, including natural phenomena. The Standard Review Plan, NUREG-1520, on page 3-12, (1)c, states that characterization of natural phenomena (e.g., tornadoes, hurricanes, floods, and earthquakes) and other external events is needed to assess their impact on facility safety and to assess their likelihood of occurrence.

The staff requires the additional information to determine how the rainfall loadings were determined from the two events stated by the applicant.

ISA-16 Section 3.3.2.2.6.2, p. 3.3-28

The application states, "The second event is localized intense rainfall associated with the Design Basis Flood. The rainfall distribution to this event is discussed in Section 3.2." The staff is unable to locate this discussion in Section 3.2 of the Safety Analysis Report. The first paragraph in Section 3.2.3.4.4 of the Safety Analysis Report discusses local intense probable maximum precipitation. The second paragraph in Section 3.2.4.3 of the Safety Analysis Report indicates no design basis flood is considered for the National Enrichment Facility site.

Under 10 CFR 70.62(c)(iv), an applicant is required to address potential accident sequences caused by external events, including natural phenomena. The Standard Review Plan, NUREG-1520, on page 3-12, (1)c, states that characterization of natural phenomena (e.g., tornadoes, hurricanes, floods, and earthquakes) and other external events is needed to assess their impact on facility safety and to assess their likelihood of occurrence.

Clarify these inconsistent statements. Indicate clearly where in Section 3.2 of the Safety Analysis Report the localized intense rainfall associated with the Design Basis Flood is discussed.

ISA-17 Section 3.3.2.2.6.2, p. 3.3-28

Clarify if the rainfall load resulting from the Design Basis Flood (the load equals the depth of water accumulated in excess of the roof drains capability) will be addressed in designing the safety significant areas by ensuring this load does not exceed the normal roof design live load or if this rainfall load will be treated as an additional design load.

Under 10 CFR 70.62(c)(iv), an applicant is required to address potential accident sequences caused by external events, including natural phenomena. The Standard Review Plan, NUREG-1520, on page 3-12, (1)c, states that characterization of natural phenomena (e.g., tornadoes, hurricanes, floods, and earthquakes) and other external events is needed to assess their impact on facility safety and to assess their likelihood of occurrence.

The staff requires the additional information to properly consider the roof design loads.

ISA-18 Sections 3.3.2.2.7.1, p. 3.3-29; 3.3.2.2.7.2, p. 3.3-29; and 3.3.2.2.7.4, p. 3.3-29

The equipment, piping, and electrical tray loads are given in the Safety Analysis Report as the sum of dead and live loads; no individual values are provided for these dead and live loads.

Explain how the combined dead and live loads will be included in the load combination applications using the strength method for concrete design, given the load factors for dead loads and live loads are different (load combination applications A and B in Section 3.3.2.2.8.3 of the Safety Analysis Report).

Under 10 CFR 70.62(c)(iii), an applicant is required to address facility hazards that could affect the safety of licensed materials and thus present an increased radiological risk. The Standard Review Plan (NUREG-1520) on page 3-13, (3)c, states that process design and equipment information needs to include a discussion of process design, equipment, and instrumentation that is sufficiently detailed to permit an adequate understanding of the results of the ISA. As appropriate, it includes schematics indicating safety interrelationships of parts of the process.

The staff requires the additional information to ensure that the equipment, piping, and electrical tray loads have been properly considered.

ISA-19 Section 3.3.2.3, p. 3.3-33

Provide technical justification to support that allowable bearing pressure for rock at the site is 10,000 psf and it is 3,000 psf for existing and new fills.

Under 10 CFR 70.62(c)(iii), an applicant is required to address facility hazards that could affect the safety of licensed materials and thus present an increased radiological risk. The Standard Review Plan (NUREG-1520) on page 3-13, (3)c, states that process design and equipment information needs to include a discussion of process design, equipment, and instrumentation that is sufficiently detailed to permit an adequate understanding of the results of the ISA. As appropriate, it includes schematics indicating safety interrelationships of parts of the process.

Due to the difference in the allowable bearing pressures, the staff requires a technical justification that is currently not provided in Section 3.3.2.3 of the Safety Analysis Report.

ISA-20 Section 3.4, General

The regulations, 10 CFR 70.22(a)(7), require that the applicant provide a description of equipment and facilities which will be used to protect health and minimize danger to life or property. The following information is needed to evaluate the instrumentation and control (I&C) systems:

a. Submit an I&C software system architecture block diagram showing interrelationship of the major software functions with the hardware, process, and plant systems. Clearly identify which software functions are involved with IROFS. Submit codes and standards framework used and correlate with hardware functions.

b. For IROFS involving software, firmware, microcode, etc., discuss the software design process used to develop the programmable logic controller (PLC) software, as well as software quality assurance programs, including configuration management. Reference any codes and/or consensus standards regarding hardware and software quality (e.g., IEEE, ASME).

c. For all systems with interfaces to the plant control system (PCS), describe the interfaces to the PCS, including the Central Control System (CCS) and the Local Control System

(LCC). Particular attention should be paid to the interconnection of IROFS to the LCC (and CCS, if applicable). Provide information on how the safety functions are independent from the process control system components at the LCC and CCS.

d. Section 3.1.7.J states, in part, "Instrumentation and control systems shall be designed to fail into a safe state or to assume a state demonstrated to be acceptable on some other basis if conditions such as disconnection, loss of energy or motive power, or adverse environments are encountered." For IROFS relying on "fail safe" instrumentation, describe the conditions that cause a safe failure and how these conditions are sensed and corrected/masked by the "fail safe" function in the IROFS. Explain how this conforms to Section 3.1.7.J by describing the implementation of the "fail safe" capability (such as on-board diagnostics and/or condition monitoring) and the kinds of failures against which the design protects (such as random failures, circuit failures, software failures, malicious failures, etc.).

e. For IROFS involving instrumentation, provide information regarding the approach used to determine the setpoint and the measurement uncertainties. Account for all uncertainties in the measurement path, from the sensor along the signal lines through the data acquisition and data conversion components to the data processing element, as appropriate.

f. Section 3.1 states, "When failure probabilities are required for an event, Table 3.1-10, Failure Probability Index Numbers, provides the index values." Section 3.8, Table 3.8-1, provides failure probability index numbers for the IROFS. For IROFS involving instrumentation and control equipment relying upon both hardware and software, describe the process(es) (including testing, analysis, and/or industry experience) that was (were) used to establish the failure probabilities (i.e., Probabilities of Failure on Demand in Table 3.1-10 and Table 3.8-1). In the discussion, clearly explain how equipment and or processes from vendors (such as Urenco, and other third-party equipment suppliers) were evaluated by LES. Provide criteria and or data upon which values in Table 3.8-1 were based (for those IROFS involving hardware and software). Reference applicable consensus standards, if applicable.

g. The regulations, 10 CFR 70.64(a)(10), require that the design must provide for inclusion of instrumentation and control system to monitor and control the behavior of IROFS. Section 3.1.7.J in the Safety Analysis Report states, in part, "Instrumentation and control systems shall be provided to monitor variables and operating systems that are significant to safety over anticipated ranges for normal operation, for abnormal operation, for accident conditions, and for safe shutdown." Describe these instrumentation and control systems and how they meet the requirements of 10 CFR 70.64(a)(10). Include reference to codes or consensus standards, if applicable.

h. The regulations, 10 CFR 70.64(a)(4), state the design must provide for adequate protection from environmental conditions and dynamic effects associated with normal operation, maintenance, testing, and postulated accidents that could lead to loss of safety functions. These include Electromagnetic Interference/Radio Frequency Interference, temperature, and humidity. Section 3.5.9.1, p. 3.5-43, states "field-proven designs fabricated from proven materials for intended...operating conditions are specified, as well as process instrumentation qualified for use in uranium enrichment

plants." For IROFS utilizing instrumentation, describe how the design complies with 10 CFR 70.64(a)(4). Reference applicable consensus standards, if applicable.

ISA-21 Sections 3.4, 3.5, 3.8, and Table 3.8-1

Provide additional information related to IROFS1 and IROFS2 for the Low Temperature Take-Off Stations in the UF_6 Feed System, the Product Take-Off System, the Tails Take-Off System, and the Product Blending System.

The regulations, 10 CFR 70.22(a)(7), require that the applicant provide a description of equipment and facilities which will be used to protect health and minimize danger to life or property.

Low Temperature Take-Off Stations (LTTSs), which include the Blending Receiver Station for the purposes of this discussion, are used in several systems in the enrichment process. The LTTSs have several IROFS, including IROFS1, IROFS2, and IROFS38. The following information is needed to evaluate I&C systems for the LTTSs:

a. The LTTSs have a stand-alone control and protection system. Of the three sensors in this stand-alone system, two are for protection, IROFS1 and IROFS2. IROFS1 monitors the circulating air temperature and is fail-safe hardwired. IROFS 2 is a fail-safe capillary device diverse from IROFS1. Both trip the defrost heater and fan power supply, and the LTTS is automatically taken off line and put into standby mode. Explain how the independence between IROFS1 and IROFS2 conforms to the statement in Section 3.8.1, p. 3.8-2, "Redundant IROFS systems will be separate and independent from each other." Identify and describe any common hardware or software components between these IROFS, from the associated sensors to final actuated device, including the LCC, CCS, or PCS. Describe the management measures for assuring reliability and availability of IROFS1 and IROFS2, including the "Annual Test" identified in Table 3.8-1 as the management measure, and explain how they comply with 10 CFR 70.62(d) and 10 CFR 70.64(a)(8).

b. The LTTSs each have a weighing system to monitor the contents of the installed cylinder. The trip setpoints are dependent upon the type of cylinder currently installed: type 48Y or type 48X for the Feed Purification LTTS; type 30B or type 48Y for the Product LTTS, type 48Y for the Tails LTTS, and type 30B for the Blending Receiver station. Two trips are associated with the weighing system, both of which close the inlet valve and place the associated LTTS into standby mode. Clarify if the LTTS weighing system (identified as "WIRSA" in the Process and Instrumentation Diagrams (P&IDs)) is associated with an IROFS. If so, identify and describe the associated IROFS in Table 3.8-1 of the Safety Analysis Report. Also, describe the associated management measures for assuring reliability and availability per 10 CFR 70.62(d). For the Feed Purification LTTS and Product LTTS, describe how the trip setpoints are enabled when changing between cylinder types. Address if this is a hardware or software function, and, if so, describe how the software is validated, per 10 CFR 70.62(d) and 10 CFR 70.64(a)(1).

c. In Table 3.8-1, IROFS38 is identified as an administrative control to prevent cylinder overfill. Is there instrumentation used by the operators to measure the cylinder weight? If so, is this instrumentation part of IROFS38? Also, if this is part of IROFS38, describe

the management measures associated with this instrumentation for assuring reliability and availability, per 10 CFR 70.62(d).

d. Section 3.1.7.K, p. 3.1-17, states, in part, "The design incorporates a preference for engineered controls over administrative controls to increase overall system reliability." In the context of 10 CFR 70.64(b)(1), which requires a preference for engineered controls over administrative controls, explain why IROFS38 is an Administrative Control, given the fact that the LTTS weighing system is an on-line system capable of tripping the LTTS automatically.

ISA-22 Sections 3.4, 3.5, 3.8, and Table 3.8-1

Provide additional information related to IROFS3 and high-temperature carbon trap trip for the Vacuum Pumps/Chemical Trap sets in the UF_6 Feed System, the Product Take-Off System, the Tails Take-Off System, and the Product Blending System.

The regulations, 10 CFR 70.22(a)(7), require that the applicant provide a description of equipment and facilities which will be used to protect health and minimize danger to life or property.

Vacuum Pumps/Chemical Trap Sets are used in several systems in the enrichment process. These components have at least two associated IROFS, including IROFS3, and IROFS9. The following information is needed to evaluate I&C systems for the vacuum pumps and chemical trap sets:

a. The carbon trap has a weighing system to detect excessive UF_6 in the trap. The weighing system is identified as IROFS3 in Table 3.8-1. It is a sole IROFS that will trip the vacuum pump when the weight reaches the setpoint. Describe the management measures for assuring reliability and availability of IROFS3, including the "Annual Test" identified in Table 3.8-1 as the management measure, and explain how they comply with 10 CFR 70.62(d) and 10 CFR 70.64(a)(8).

b. In the associated P&IDs for both the Tails Take-Off System and Product Blending System Carbon Traps, the weighing system is not shown as an "Emergency or Safety Acting" function. Explain why this weighing system is not labeled with "WIZA" even though it has an associated IROFS.

c. The purpose of the carbon trap high-temperature trip is unclear. In the system descriptions for the UF_6 Feed System and the Tails Take-Off System, the trip function is not a safety action. In the system descriptions for the Product Take-Off System and the Product Blending System, the trip function is associated with IROFS9, which is an administrative control according to Table 3.8-1 of the Safety Analysis Report. However, in the P&IDs for each of these systems, the trip function is labeled as an "Emergency or Safety Acting" function. Clarify for which systems the high-temperature trip for the carbon trap is in fact an IROFS, and whether it is an active engineered control or an enhanced administrative control. If the latter, describe the operator action(s) mentioned in Table 3.8-1 for IROFS9 as well as the supporting software and/or hardware for these actions (e.g., control room indicators, pushbuttons). For those systems in which the high-temperature trip is an IROFS, describe the management measures associated with this IROFS for assuring reliability and availability, per 10 CFR 70.62(d).

d. Section 3.1.7.K, p. 3.1-17, states, in part, "The facility and system designs are based on defense-in-depth practices." Given the fact that IROFS3 is a sole IROFS, explain why the high-temperature trip is not used as a diverse safety function in compliance with 10 CFR 70.64(b) pertaining to diversity and defense-in-depth.

ISA-23 Sections 3.4, 3.5, 3.8, and Table 3.8-1

Provide additional information related to the IROFS for the Solid Feed Station in the UF_6 Feed System and the Blending Donor Station in the Product Blending System.

The regulations, 10 CFR 70.22(a)(7), require that the applicant provide a description of equipment and facilities which will be used to protect health and minimize danger to life or property.

The Solid Feed Station and the Blending Donor Station have IROFS4 and IROFS5. The following information is needed to evaluate I&C systems for the Solid Feed and the Blending Donor Stations:

a. In the description of the Blending Donor Station, there is a discrepancy in the trip setpoint associated with IROFS5. Section 3.4.6.7.A states the trip is set at 63°C. Section 3.4.6.8.E states the trip is set at 54°C. Please clarify the trip setpoint and provide corrected pages for the Safety Analysis Report.

b. Explain how the independence between IROFS4 and IROFS5 conforms to the statement in Section 3.8.1, p. 3.8-2, "Redundant IROFS systems will be separate and independent from each other." Identify and describe any common hardware or software components between these IROFS, from the associated sensors to final actuated device, including connections to/from the LCC, CCS.

c. Describe the management measures for assuring reliability and availability of IROFS4 and IROFS5, including the "Annual Test" identified in Table 3.8-1 as the management measure, and explain how they comply with 10 CFR 70.62(d) and 10 CFR 70.64(a)(8).

ISA-24 Sections 3.4, 3.5, 3.8, and Table 3.8-1

Provide additional information related to the IROFS for the Cascade System.

The regulations, 10 CFR 70.22(a)(7), require that the applicant provide a description of equipment and facilities which will be used to protect health and minimize danger to life or property.

The Cascade System relies on IROFS3 for certain configurations, as well as a "fail safe" configuration during cascade failures. The following information is needed to evaluate I&C systems for the Cascade System:

a. The contingency dump system is the fail-safe mode for removing UF_6 from a cascade in case of process upset or failure. Identify the system that performs the realignment of the valves during such an event and describe the connections from the valve station to the system performing the alignment of valves, including hardware and software components. If this emergency realignment is an IROFS, describe the management

measures associated with the valve station for assuring reliability and availability per 10 CFR 70.62(d).

b. Two mobile evacuation rigs maintain low pressure in a cascade prior to and during run-up and run-down. The sample rig is for periodic UF_6 sample collection during operation. Both rigs connect to a cascade at the cascade valve station. The sample rig relies on sole IROFS3, the weighing system for the carbon trap on the mobile rig. Describe the operation of IROFS3 on the sampling rig in detail, including configuration, instrumentation, connections to CCS and LCC.

c. Describe the connections from the rigs to the centrifuge valve station. Describe the connections, as well as any trip inputs, from IROFS3 on the Mobile Sampling Rig to the valve station, if applicable. Describe the management measures associated with the

IROFS3 on the Mobile Sampling Rig for assuring reliability and availability, per 10 CFR 70.62(d).

ISA-25 Sections 3.4, 3.5, 3.8, and Table 3.8-1

Provide additional information related to the IROFS for the Product Take-Off System.

The regulations, 10 CFR 70.22(a)(7), require that the applicant provide a description of equipment and facilities which will be used to protect health and minimize danger to life or property.

Section 3.4.4.1 states the Product Take-Off System "is operated from the Control Room, with the exception of the vacuum pump and cylinder maintenance and preparation operations, which are controlled locally." The description of IROFS9 indicates the CCS supports IROFS9 in that the CCS is relied on for operator action to protect against release of UF_6 to the environment. Explain why the CCS is not an IROFS.

ISA-26 Sections 3.4, 3.5, 3.8, and Table 3.8-1

Provide additional information related to the IROFS for the Product Liquid Sampling System.

The regulations, 10 CFR 70.22(a)(7), require that the applicant provide a description of equipment and facilities which will be used to protect health and minimize danger to life or property.

The main component in the Product Liquid Sampling System is the autoclave. The autoclave has several IROFS, including IROFS11, IROFS12, and IROFS13. The following information is needed to evaluate I&C systems for the Product Liquid Sampling System:

a. The discussion on the autoclave stand-alone control system in Section 3.4.4.7 states the system performs control and protection functions. Identify and describe the IROFS that connect to this stand-alone control system, including the "six timers" mentioned in Section 3.4.7.7 and how these timers are implemented (hardware or software).

b. Figure 3.4-13 does not have any "Z" labels (according to the Figure Legend, "Emergency or Safety Acting" label) for the sensors/instruments associated with IROFS. Provide an updated figure showing the safety sensors/instruments.

c. Figure 3.4-13 shows five Product Liquid Sampling Autoclaves. This is inconsistent with Figure 3.5-27, sheet 3, which shows only four autoclaves. Clarify the number of autoclaves and provide a corrected P&ID.

d. The autoclave's stand-alone control and protection system has diverse IROFS monitoring temperature and pressure, IROFS11 and IROFS12, respectively. Both automatically de-energize the autoclave heaters and fan. Explain how the independence between IROFS11 and IROFS12 conforms to the statement in Section 3.8.1, p. 3.8-2, "Redundant IROFS systems will be separate and independent from each other." Identify and describe any common hardware or software components between these IROFS, from the associated sensors through the LCC, CCS, or PCS to the final actuating elements. Describe the management measures for assuring reliability and availability IROFS11 and IROFS12, including the "Annual Test" identified in Table 3.8-1 as the management measure, and explain how they comply with 10 CFR 70.62(d) and 10 CFR 70.64(a)(8).

e. Other non-safety control components trip the heater and fan. Describe these connections to the final actuated device that removes electrical power from the heaters and fans. Describe the independence between IROFS connections and the non-safety connections to the final actuated device, if applicable.

ISA-27 Sections 3.4, 3.5, 3.8, and Table 3.8-1

Provide additional information related to the IROFS in the Contingency Dump System.

The regulations, 10 CFR 70.22(a)(7), require that the applicant provide a description of equipment and facilities which will be used to protect health and minimize danger to life or property.

In Section 3.4.8.7, there is discussion on the high temperature alarm for the carbon trap, but no discussion on the protection weight trip. Provide information on the IROFS associated with this weight trip (IROFS3), per 10 CFR 70.22(a)(7). Also, identify which vacuum pump IROFS3 trips. Also, describe the management measures for assuring reliability and availability of IROFS3, including the "Annual Test" identified in Table 3.8-1 as the management measure, and explain how they comply with 10 CFR 70.62(d) and 10 CFR 70.64(a)(8).

ISA-28 Sections 3.4, 3.5, 3.8, and Table 3.8-1

Provide additional information related to the IROFS in the Gaseous Effluent Vent Systems (GEVS) in the Separations Building and the Technical Services Building.

The regulations, 10 CFR 70.22(a)(7), require that the applicant provide a description of equipment and facilities which will be used to protect health and minimize danger to life or property.

Both GEVS descriptions are similar as far as the instrumentation. The differences between the associated IROFS are that IROFS8 in the Separations Building (SB) GEVS switches between main and backup filter trains, and isolates the electrostatic precipitator, while IROFS21 in the Technical Services Building (TSB) GEVS trips the GEVS fan. It is difficult to identify the emergency or safety acting functions in the figures for the SB and TSB GEVS, Figure 3.4-17 and Figure 3.4-18, respectively. Provide updated drawings with "Z" identifiers, as appropriate, for these systems. Also, describe the management measures for assuring reliability and availability of IROFS8 and IROFS21, including the "Annual Test" identified in Table 3.8-1 as the management measure, and explain how they comply with 10 CFR 70.62(d) and 10 CFR 70.64(a)(8).

ISA-29 Sections 3.4, 3.5, 3.8, and Table 3.8-1

Provide additional information related to the IROFS in the Centrifuge Test and Centrifuge Post Mortem Processes.

The regulations, 10 CFR 70.22(a)(7), require that the applicant provide a description of equipment and facilities which will be used to protect health and minimize danger to life or property.

The discussion in Section 3.4.10.1.4 mentions a temperature trip and a pressure trip of the electrical heaters used for heat tracing the feed vessel. Only one high temperature trip is discussed, but two temperature-related IROFS are associated with tripping the electrical heaters, IROFSC15 and IROFSC16. Provide further information on IROFSC15 and IROFSC16, per 10 CFR 70.22(a)(7). Describe the management measures for assuring reliability and availability of IROFSC15 and IROFSC16, including the "Annual Test" identified in Table 3.8-1 as the management measure, and explain how they comply with 10 CFR 70.62(d) and 10 CFR 70.64(a)(8).

ISA-30 Section 3.4.3.3, p. 3.4-16

Describe the safety margins needed to assure that loads resulting from a centrifuge failure do not result in rotor debris penetration of the casing or break away of the floor mounting elements (flomels). Identification of specific industry codes or standards or operational test results is acceptable.

The regulations, 10 CFR 70.22(a)(7), require a description of the equipment and facilities which will be used to protect health and minimize danger to life or property.

Section 3.4.3.3, Design Description [Cascade System], states that the resultant loads from centrifuge failures are restrained by the casing and the floor mounting element. These components are designed so rotor debris does not penetrate the casing and the flomels do not break away from the floor.

ISA-31 Section 3.4.4, pp. 3.4-18 through 3.4-26

Provide a list of light and intermediate weight gases that could be trapped in cold traps. Are any of these gases explosive or combustible alone or in combination with other light or intermediate weight gases?

The regulation 10 CFR 70.22(a)(7) requires the applicant to provide a description of equipment and facilities that will be used by the applicant to protect health and minimize danger to life or property. In addition, the regulation 10 CFR 70.62(c)(1)(iii) requires that the integrated safety analysis identifies facility hazards that could effect the safety of licensed materials and thus present an increased radiological risk.

The discussion of cold traps in the product take-off system does not provide information on potentially combustible or explosive gases that might be collected in the cold traps.

ISA-32 Section 3.4.9, pp. 3.4-54 through 3.4-62; Section 4.6.1, pp. 4.6-1 through 4.6-2

Provide information related to codes and standards for GEVS design and in-place filter testing.

The regulations, 10 CFR 70.22(a)(7) require that the applicant provide a description of equipment and facilities that will be used to protect health and minimize danger to life or property.

In Section 3.4.9 of the application, the applicant indicates that a prefilter with an efficiency of 85 percent and a charcoal filter with an efficiency of 99.9 percent will be used. However, no reference to testing standards are provided. The staff assumes the High Efficiency Particulate Air (HEPA) filter efficiency is based on removal of 0.3 micron particles and will meet the requirements of American Society of Mechanical Engineers (ASME) AG-1, “Code on Nuclear Air and Gas Treatment,” Section FC.

Section 3.4.9 indicates that gas monitors are provided to continuously monitor effluents from the GEVS. What are the sensitivities of the gamma and HF monitors?

In Sections 3.4.9 and 4.6.1 of the application, the applicant describes the ventilation program and air cleaning systems. However, reference is not made to the most current ventilation system design standards in ASME AG-1. Will filtration systems be designed in accordance with ASME AG-1?

In Section 4.6.1 of the application, the applicant states that filter inspection and testing will be performed in accordance with written procedures. A general statement referring to ASME N510, “Testing of Nuclear Air-Cleaning Systems,” is made. However, no specific information is provided on in-place filter testing frequencies or leakage efficiency goals for HEPAs or for the charcoal adsorbers.

Sections 3.4.9 and 4.6.1 of the application do not discuss temperature instrumentation downstream of the filter assemblies to detect high temperatures in the event of filter unit fires. Do temperature monitors with alarms and the capability to shut down fans exist in the system? If not, justify why this instrumentation is not included.

ISA-33 Section 3.5.1, pp. 3.5-1 through 3.5-12

Justify the lack of air effluent monitoring in areas where dispersible forms of uranium are stored or processed, which are not serviced by filtered exhaust systems with continuous monitoring.

10 CFR 20.1501 requires that surveys be made to measure the levels of radioactive material and

the potential radiological hazards.

Further, NRC Regulatory Guide 4.16, Regulatory Position C.2., states "Gaseous effluents from all operations associated with the plant, including such nonprocessing areas as laboratories, experimental areas, storage areas, and fuel element assembly areas, should be sampled. For gaseous effluents from process confinement systems and process areas where material is handled in dispersible form, a representative sample of the effluent from each stack, vent, or other point of release should be collected continually for subsequent determination of quantities and average concentrations of radionuclides released. This sampling should be conducted regardless of the concentrations of radioactive material in the effluent."

In the Environmental Report, Table 6.1-1, "Effluent Sampling Program," the applicant proposes to sample process areas only as required to complement the bioassay program. Presumably, the samplers referenced in Table 6.1-1 are those described in Section 4.8.1.2 of the Safety Analysis Report. However, these samplers would not be sufficient to permit a determination of the quantities of radionuclides and the average concentration of radionuclides being discharged from the plant.

Areas of specific concern to the staff include: (1) the Blending and Liquid Sampling Area; (2) Process Services Corridors (3 modules); (3) Link Corridors (3 modules); (4) UF6 Handling Areas (3 modules); (5) Vacuum Pump Rebuild and ME&I Workshops; (6) Chemical and Mass Spectrometry Lab and Environmental Laboratory; (7) and the Cylinder Receipt and Dispatch Building.

ISA-34 Section 3.5.1, pp. 3.5-1 through 3.5-12

Provide room volumes, room volumetric flow, and Heating Ventilating and Air Conditioning (HVAC) exhaust flow rates for each likely configuration of the HVAC systems described in Section 3.5.1 of the Safety Analysis Report.

10 CFR 70.65(b)(3) states that the ISA Summary must contain "a general description of the facility with emphasis on those areas that could affect safety."

The acceptance criteria in Standard Review Plan section 3.4.3.2(3), Processes, states that a description at a systems level is acceptable, provided that it permits the NRC reviewer to adequately evaluate (1) the completeness of the hazard and accident identification tasks and (2) the likelihood and consequences of the accidents identified.

The staff requires room volumes, room volumetric flow, and HVAC exhaust flow rates to independently evaluate the consequences of the accidents identified in the ISA Summary.

ISA-35 Section 3.5.2, pp. 3.5-13

Discuss how hydrogen is controlled in areas containing batteries. Also, discuss any related industry standard and codes used to prevent hydrogen explosions near batteries. Provide a discussion of the control power for the 480/460 V breakers, if any.

The regulations, 10 CFR 70.65(b)(3), require that the ISA Summary should contain a description of each process and the hazards that were identified in the ISA. The regulations, 10

CFR 70.22(a)(7), require that the applicant provide a description of equipment and facilities that will be used to protect health and minimize danger to life and property.

Safety Analysis Report Section 3.5.2.1.3 indicated that batteries provide backup power for the Un-interruptible Power Supply (UPS), starting power for each standby diesel generator, and control power for the 13 kV and 4160 V switchgear. The batteries give up hydrogen gas and buildup of hydrogen gas is a concern for explosion. Since the applicant did not address hazards from hydrogen explosions near batteries, discuss how hydrogen is controlled in areas containing batteries. Also discuss any related industry standard and codes used to prevent hydrogen explosions near batteries.

Safety Analysis Report Section 3.5.2.1.3 discusses the batteries that are used to control the 13 kV and 4160 V switchgear, but does not discuss the batteries for the 480/460 V breakers. Provide a discussion of the control power for these breakers, if any.

ISA-36 Section 3.5.2, p. 3.5-12

Describe any emergency electrical power requirements needed to support the various environmental, security, fire and emergency response functions should a loss of off-site power occur.

10 CFR 70.22(a)(7), requires a description of the equipment and facilities which will be used to protect health and minimize danger to life or property. 10 CFR 70.22(i) addresses emergency response functions, and 10 CFR 70.22(k) addresses safeguards requirements.

Section 3.5.2, Electrical Systems, states that a total loss of electrical power does not have any safety implications. However, various environmental (assessment of releases), security, fire and emergency response functions may need to remain functional during an event involving the loss of off-site power.

ISA-37 Section 3.5.12.1.1.8, p. 3.5-58

Explain the means by which a representative sample is collected from the Treated Effluent Monitor Tanks.

The regulations, 10 CFR 20.1302, requires appropriate surveys and measurement to be conducted to demonstrate that dose limits are met. NRC Regulatory Guide 4.16, Regulatory Position C.2.2, states "Representative samples should be collected at each liquid release point for the subsequent determination of the quantities and average concentrations of radionuclides discharged in any liquid effluents that could reach an unrestricted area, including discharges to a sanitary sewerage system."

ISA-38 Section 3.5.12.1.4, p. 3.5-60

Describe the bookkeeping measures needed to ensure that no tank holds more than a safe mass of uranium.

10 CFR 70.61(a) requires each applicant to evaluate, in the ISA performed in accordance with §70.62, its compliance with the performance requirements in paragraphs (b), (c) and (d) of this section.

The application states that bookkeeping measures ensure that no tank holds more than a safe mass of uranium. In Section 3.5.12.1.5, the applicant states that the uranium content of tanks is important to prevent a criticality accident. None of the tanks in the collection and treatment system are "geometrically safe" or "geometrically favorable". Administrative controls (by mass) are applied to prevent a criticality accident. Additional information on the bookkeeping measures is needed to assess the effectiveness of this provision.

ISA-39 Section 3.5.15, pp. 3.5-79 through 3.5-81

Provide the combustion characteristics of Fomblin oil (flash point, fire point, heat of combustion, etc.)

The regulation 10 CFR 70.22(a)(7) requires the applicant to provide a description of equipment and facilities which will be used by the applicant to protect health and minimize danger to life or property. In addition, the regulation 10 CFR 70.62(c)(1)(iii) requires that the integrated safety analysis identifies facility hazards that could effect the safety of licensed materials and thus present an increased radiological risk.

The discussion in the Safety Analysis Report of Fomblin oil does not state that this oil is noncombustible nor does it provide any discussion of potential fire hazards presented by the oil.

ISA-40 Section 3.5.17, p. 3.5-84

Discuss if maintaining the ventilated room at a negative pressure is an IROFS function.

The regulations, 10 CFR 70.22(a)(7), require that the applicant provide a description of equipment and facilities that will be used to protect health and minimize danger to life and property. The regulations, 10 CFR 70.61(e) requires the applicant to designate each engineered or administrative control or control system necessary to meet the performance requirements of 10 CFR 70.61 as an IROFS.

Section 3.5.17.1 states that the ventilated room is maintained at a negative pressure to help mitigate any release. Is this an IROFS function? If so, discuss.

ISA-41 Section 3.7.1, Table 3.7-2 and Section 3.7.2, Table 3.7-3

Identify whether the environmental performance requirement in 10 CFR 70.61(c)(3) was met for each of the events described in the ISA Summary.

10 CFR 70.65(b)(4) requires that the ISA Summary contain information that demonstrates the licensee's compliance with the performance requirements of 10 CFR 70.61.

NRC acceptance criteria in Standard Review Plan, Section 9.4.3.2.3 states that the applicant's ISA is acceptable if adequate engineering or administrative controls are identified for each accident sequence of environmental significance. However, in the ISA Summary, the applicant did not indicate whether the performance requirement in 10 CFR 70.61(c)(3) was met for each of the events summarized in Tables 3.7-2 and 3.7-3.

ISA-42 Sections 3.8.1 and 5.1.1 and Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Clarify what was meant by the Sole IROFS in Table 3.8-2.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61. 10 CFR 70.65(b)(8) requires in the ISA Summary a descriptive list that identifies all items relied on for safety that are the sole item preventing or mitigating an accident sequence that exceeds the performance requirements of 10 CFR 70.61.

For example, in nuclear criticality safety, given the requirements of 10 CFR 70.65(b)(8), the commitment to the double contingency principle in Chapter 5.0, and the RAI question regarding what an IROFS is (i.e., ISA-1), it is unclear how there could be any nuclear criticality safety sole item relied on for safety.

ISA-43 Section 3.8.1, pgs. 3.8-1 - 3.8-2 and Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Clarify why there appears to be no management measures associated with IROFS25, IROFS27, and eight other NCS IROFS.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61, including a description of the management measures.

All applicable management measures need to be applied to all IROFS.

ISA-44 Tables 3.7-1 and 3.7-2

Clarify whether the criticality event assumed in accident sequence EC4-2 results in an intermediate consequence to the worker.

10 CFR 70.61(a) requires each applicant to evaluate, in the ISA performed in accordance with §70.62, its compliance with the performance requirements in paragraphs (b), (c) and (d) of this section.

Table 3.7-2, Accident Sequence Descriptions, accident sequence EC4-2 states that this event is assumed to have an intermediate consequence to the worker and the public. However, Table 3.7-1, Accident Sequence and Risk Index, identifies this as a high consequence event.

ISA-45 Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Clarify whether it was your intent to rely upon the design of your facility in the license application in lieu of designating IROFS for components/equipment when evaluating accident sequences for compliance with 10 CFR 70.61.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application. 10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61.

In the criticality analyses that were performed to support the ISA, the applicant made certain assumptions (e.g., design included favorable geometry equipment) and concluded that certain event sequences would be prevented. These assumptions related to specific systems or components that were not identified as IROFS. In addition, Table 5.1-2 lists other specific design attributes of the facility that are also not identified as IROFS. The applicant has placed these design assumptions and attributes under the Configuration Management system whereby any changes would be specifically evaluated. The staff considers that these design attributes are fundamental to the application review, and, if changes are made, in addition to the Configuration Management controls, the changes would need to be submitted for staff review in a license amendment as required under 10 CFR 70.72(c)(1)(i). Under 10 CFR 70.72(c)(1)(i), no changes to the site, structures, processes, systems, equipment, components, computer programs, and activities of personnel, without prior Commission approval, that have not been previously described in the ISA Summary.

ISA-46 Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Clarify how IROFS relate to the accident sequences, other IROFS, and management measures.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61.

There needs to be a clear understanding of each IROFS. For example, in nuclear criticality safety: some of the IROFS appear to be several IROFS rolled up into a single IROFS (e.g., IROFS6, IROFS9, and others); some appear to be IROFS plus management measures (e.g., IFORS6, IROFS15, and others); and some appear to be programs (e.g., IROFS16 (moderator control) and IROFS19 (mass control)).

ISA-47 Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Clarify the basis for the frequency index number (FFIN) for enhanced administrative controls and administrative controls.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61.

For example, in nuclear criticality safety, most active engineered controls have FFINs of -2 while most enhanced administrative controls and administrative controls have FFINs of -3, which is a more robust value. This appears to be inconsistent because one would expect an active engineered control to be more robust than either an enhanced administrative or administrative control.

ISA-48 Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Clarify what was meant by listing only a few management measures under the column ‘Reliability Management Measures’ in Table 3.8-1.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61, including a description of the management measures.

All applicable management measures need to be applied to all IROFS; however, there are only a few or no management measures listed for each IROFS in Table 3.8-1. The following examples are the only descriptions of the 'Reliability Management Measures' from Table 3.8-1 for nuclear criticality safety accident sequence IROFS:

> Annual Inspection - IROFS14 and IROFS17
> Annual Test - IROFS3, IROFS8, IROFS13, IROFS20, IROFS21, and IROFS22
> Annual Test, Operator Training, and Annual Refresher - IROFS9
> Operator Training and Annual Refresher - IROFS6, IROFS15, IROFS16, IROFS18, IROFS19, IROFS45 , IROFSC1, IROFSC6, IROFSC7, and IROFSC14
> Personnel Training and Annual Refresher - IROFS40
> N/A - IROFS25, IROFS29, IROFS30, IROFS31, IROFS32, IROFS33, IROFS34, and IROFS44

ISA-49 Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Correct information in the tables for consistency.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61.

Accident sequence "EE-local precip" is identified as an NCS accident sequence in Table 3.7-1, but is not addressed in Tables 3.7-3, 3.8-1 and 3.8-2.

Accident sequence "EE-Internal flooding from on-site tanks and water impoundments" is identified as an NCS accident sequence in Table 3.7-4, but not in Table 3.7-3.

"AC" is used to designate both administrative control and enhanced administrative control. These need to have two different designations.

ISA-50 Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Clarify the criteria for selecting the Initiating Event Frequency (IEF) for NCS accident sequences.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61.

There needs to be a clear description of the method used for selecting the IEFs for NCS accident sequences. That method needs to be applied consistently. The method of selecting the IEFs appears to be based on the frequency of the consequences of the accident (i.e., criticality occurring) rather than on the frequency of the initiating event of the accident sequence.

ISA-51 Table 3.7-2

Clarify whether accident sequence DC1-8 evaluated the effects of a dump operation on members of the public.

10 CFR 70.61(a) requires each applicant to evaluate, in the ISA performed in accordance with §70.62, its compliance with the performance requirements in paragraphs (b), (c) and (d) of this section.

Table 3.7-2, Accident Sequence Descriptions, accident sequence DC1-7, states that the impact to the workers in the vicinity and impact to the public is evaluated in accident sequence DC1-8. However, accident sequence DC1-8 appears to only address impact on the worker in the vicinity.

ISA-52 Table 3.7-4, p. 19

Provide the amount of UF_6 released in accident identifier FF16-1 unless IROFS36 is designed to prevent this scenario.

The regulation 10 CFR 70.62(c)(1)(iii) requires that the ISA identifies facility hazards that could effect the safety of licensed materials and thus present an increased radiological risk. Furthermore, 10 CFR 70.65(b)(6) requires that the integrated safety analysis summary contain a list briefly describing each item relied on for safety that is identified pursuant to 10 CFR 70.61(e) in sufficient detail to understand their functions in relation to the performance requirements of 10 CFR 70.61.

The postulated fire, from improperly placed transient combustibles is assumed to cause the failure of a single cylinder hose. It is not clear from the scenario description whether the purpose of the IROFS36 is to prevent only a buildup that could rupture a cylinder and thus limit the release to a hose or to also prevent placement of combustibles that could cause rupture of a hose. If the hose is allowed to rupture, NRC staff will need to verify the consequence level determined.

ISA-53 Table 3.7-4, p. 24

Provide the amount of UF_6 released in accident identifier FF25-1 unless the IROFS36 is designed to prevent this scenario.

The regulation 10 CFR 70.62(c)(1)(iii) requires that the ISA identifies facility hazards that could effect the safety of licensed materials and thus present an increased radiological risk. Furthermore, 10 CFR 70.65(b)(6) requires that the ISA summary contain a list briefly describing each item relied upon for safety that is identified pursuant to 10 CFR 70.61(e) in sufficient detail to understand their functions in relation to the performance requirements of 10 CFR 70.61.

The postulated fire, from improperly placed transient combustibles, is assumed to cause the failure of a single cylinder hose. It is not clear from the scenario description whether the purpose of the IROFS36 is to prevent only a buildup that could rupture a cylinder and thus limit the release to a nitrogen hose or vent line or to also prevent placement of combustibles that could cause rupture of the hose or vent line. If the hose or vent line is allowed to rupture, NRC staff will need to verify the consequence level determined.

ISA-54 Table 3.7-4 pp. 20 through 27

Describe the types and expected quantities of combustible materials in the various areas of the Technical Services Building. Also, describe the means of storage of these combustibles from a fire protection perspective. Of special interest is the Solid Waste Collection Room, the Decontamination Workshop, and the Ventilated Room. What is the potential for a flashover fire in the above listed areas? What are the combustible properties of the organic liquid in the solid waste collection system listed in Table 6.1-4, page 2 of the Safety Analysis Report?

The regulation 10 CFR 70.22(a)(7) require the applicant to provide a description of equipment and facilities which will be used by the applicant to protect health and minimize danger to life or property. In addition, the regulation 10 CFR 70.62(c)(iii) requires that the integrated safety analysis identifies facility hazards that could effect the safety of licensed materials and thus present an increased radiological risk.

The uranium inventory in the listed rooms is described in the ISA Summary as being in open containers, sealed metal containers, drums, and other containers that may offer relatively little protection in the event of a fire. The release assumed in the ISA Summary requires that the fire be relatively limited in terms of heat release and unable to spread beyond the original concentration of combustibles in which it originated. The staff requires an adequate description of the expected combustibles in these areas to verify these assumptions.

ISA-55 Table 3.7-4, pp 21. through 24

Provide a rationale for the assumed source term for scenarios FF21-2, FF23-2, and FF25-2.

The regulation 10 CFR 70.62(c)(1)(iii) requires that the ISA identifies facility hazards that could effect the safety of licensed materials and thus present an increased radiological risk. Furthermore, 10 CFR 70.65(b)(6) requires that the ISA summary contain a list briefly describing each item relied upon for safety that is identified pursuant to 10 CFR 70.61(e) in sufficient detail to understand their functions in relation to the performance requirements of 10 CFR 70.61.

The basis for the amount of material released is not apparent from the discussion and needs to be consistent with both operational and physical fire considerations.

ISA-56 Section 3.8.1, pp. 3.8-1 and 3.8-2

Describe how the attributes and boundaries of each IROFS will be identified to plant personnel, including operations, maintenance, and engineering, once final design is completed (i.e., define how appropriate information concerning IROFS will “flowdown” to the plant staff).

10 CFR 70.62(c)(1)(vi) requires each applicant to conduct and maintain an ISA of appropriate detail for the complexity of the process, that identifies for each IROFS, the characteristics of its preventive, mitigative, or other safety function, and the assumptions and conditions under which the item is relied on to support compliance with the performance requirements of 10 CFR 70.61.

Section 3.8.1, IROFS, states that management measures will ensure that IROFS are designed, implemented and maintained, as necessary, to be available and reliable to perform their safety functions when needed. Information related to IROFS hardware design details, identification of essential utilities, operating ranges and limits, etc., will be available onsite in the ISA documentation, once final design is complete. Table 3.8-1, Items Relied on for Safety (IROFS), describes the IROFS safety function and reliability management measures.

ISA-57 Table 3.8-1, p. 4 of 14

Define autoclave pressure integrity.

10 CFR 70.62(c)(1)(vi) requires each applicant to conduct and maintain an ISA of appropriate detail for the complexity of the process, that identifies for each IROFS, the characteristics of its preventive, mitigative, or other safety function, and the assumptions and conditions under which the item is relied on to support compliance with the performance requirements of 10 CFR 70.61.

IROFS 10 is the autoclave vessel assembly pressure boundary integrity and the reliability management measure is an annual inspection. What actually constitutes autoclave integrity could involve a number of attributes such as the fabrication, testing and maintenance in accordance with an ASME pressure vessel code, verification of seal integrity, and confirmation of pressure integrity during heat-up.

ISA-58 Table 3.8-1, pp. 10, 11, and of 14

Provide a definition of an “enhanced “ administrative IROFS. Confirm that any enhanced administrative controls will be captured in written procedures. Also, provide definitions of “passive engineered controls,” “active engineered controls,” and “administrative controls.”

The regulation 70.61(e) requires that each engineered or administrative control or control system necessary to comply with the performance requirements of section 10 CFR 70.61 be designated as an item relied on for safety. In addition, 70.65(b)(6) requires that the ISA summary contain a list briefly describing each IROFS that is identified pursuant to 10 CFR 70.61(e) in sufficient detail to understand their functions in relation to the performance requirements of 10 CFR 70.61.

For example, IROFS36 is often referred to as an “enhanced” administrative IROFS by the applicant and assigned a failure probability index of -3. What is the difference between an administrative control and an enhanced administrative IROFS as used by the applicant?

Also, IROFSC 14 is an “enhanced” administrative control on centrifuge weight prior to post mortem, and the reliability management measure is operator training and refresher training. It is not clear whether there will be a procedure component or any hardware components (such as a gamma measuring instrument and whether that instrument is under the QA program) to this or other “enhanced” administrative controls.

ISA-59 Table 3.8-1, p. 12 of 14

Define the term “independent verification.”

10 CFR 70.62(c)(1)(vi) requires each applicant to conduct and maintain an ISA of appropriate detail for the complexity of the process, that identifies for each IROFS, the characteristics of its preventive, mitigative, or other safety function, and the assumptions and conditions under which the item is relied on to support compliance with the performance requirements of 10 CFR 70.61.

IROFS 40 is the control of storage interaction through the use of administrative controls that include "independent" verification. The identified reliability management measure is personnel training and annual refresher training. However, what constitutes an "independent " verification, whether proceduralized and separated by time, method or personnel performing the action is not defined.

ISA-60 Table 3.8-1, p. 5 of 14

Clarify whether IROFS 19, administrative control for criticality mass control, applies to the liquid effluent collection and treatment system.

10 CFR 70.61(e) requires that each engineered or administrative control or controlled system necessary to comply with paragraphs 10 CFR 70.61(b), (c) or (d) of this section shall be designated as an item relied on for safety.

Table 3.8-2, Sole Items Relied On For Safety (IROFS), identifies IROFS 19, administrative control for criticality mass control, as applicable to certain accident sequences for the liquid effluent collection system. However, Sections 3.5.12.1.4 and 3.5.12.2.2 state that there are no IROFS associated with this portion of the liquid effluent collection and treatment system.

ISA-61 Table 3.8-1, pp. 6, 7, and 11

Discuss the basis for concluding that the electrical system is not an IROFS for the GEVS, the fire detection and alarm system, and the cold trap high temperature interlock for the Cold Trap No. 2 Valve.

The regulations, 10 CFR 70.22(a)(7), require that the applicant provide a description of equipment and facilities that will be used to protect health and minimize danger to life and property. The regulations, 10 CFR 70.61(e) requires the applicant to designate each engineered or administrative control or control system necessary to meet the performance requirements of 10 CFR 70.61 as an IROFS. Also 10 CFR 70.62(d) requires the applicant to establish management measures to ensure compliance with the performance requirements of 10 CFR 70.61.

In Table 3.8-1, IROFS 24 is identified as an administrative control for the Technical Services Building (TSB) Gaseous Effluent Vent System (GEVS). Through the use of procedures and training, (1) the TSB GEVS is required to be connected to the assembly used to remove airborne sodium fluoride fines and operating during the handling of chemical dump trap material containing uranic material, and the (2) the TSB GEVS is to be connected to Chemical Lab Hood when UF_6 Sub-sampling Unit is operated. Because this discussion appears to imply that the TSB GEVS is needed for the performance of the safety function, is the TSB GEVS an IROFS? If so, should not electrical power be an IROFS also since it would be needed for the TSB GEVS to perform its safety function? Discuss what management measures are applied to electrical system if the electrical system is an IROFS.

In Table 3.8-1, IROFS 37 is identified as the fire detection and alarm system with ventilation shutoff interlock. Because this discussion appears to imply that electrical power is required for the fire detection and alarm system to perform its safety function, explain why electrical power is not an IROFS. Also discuss what management measures are applied to electrical system if the electrical system is an IROFS.

In Table 3.8-1, IROFS 20 is identified as a cold trap high temperature interlock for the Cold Trap No. 2 Valve. Because this discussion appears to imply that electrical power is required for this interlock to perform its safety function (close this valve), explain why electrical power is not an IROFS.

ISA-62 Table 3.8-1

Provide the technical basis for demonstrating that administrative control IROFs will meet the performance requirements of 10 CFR 70.61.

The regulations in 10 CFR 70.61 and 70.62 require that an applicant perform an ISA of the hazards associated with the proposed facility and demonstrate compliance with the performance requirements in10 CFR 70.61(b), (c), and (d).

Table 3.8-1 lists approximately fifteen (15) additional administrative control IROFS not designated as Class A. While these are not classified as sole IROFS, the applicant needs to demonstrate that it can meet the performance requirements in 10 CFR 70.61 with administrative controls. The applicant needs to provide an improved technical basis.

ISA-63 Table 3.8-1, pp. 10 of 14 through 11 of 14; Table 3.7-4, pp. 12 of 29 through 29 of 29

Provide a comprehensive description of how the applicable attributes of IROFS36 provide a prevention or mitigation role in the sequences in which they are used. In addition, discuss how design margin and surveillances are incorporated into combustible loading controls to achieve the desired reliability.

The regulation 10 CFR 70.65(b)(6) requires that the ISA summary contain a list briefly describing each item relied upon for safety that is identified pursuant to 10 CFR 70.61(e) in sufficient detail to understand their functions in relation to the performance requirements of 10 CFR 70.61.

In Table 3.7-4, IROFS36 is used in a number of different fire accident sequences but it is not clear, in many cases, what attribute is being credited and why it is being credited.

ISA-64 Table 3.8-1, p. 10 of 14

Describe what measures will be employed to prevent fire barriers (IROFS35) that protect areas containing radioactive material from being breached. Acceptable examples could be design margin, combustible loading controls, automatic suppression, or a combination of these measures).

The regulation 10 CFR 70.65(b)(6) requires that the ISA summary contain a list briefly describing each item relied upon for safety that is identified pursuant to 10 CFR 70.61(e) in

sufficient detail to understand their functions in relation to the performance requirements of 10 CFR 70.61.

IROFS35 is often used as a single IROFS with a failure index number of -3 without any discussion of how the integrity of this IROFS will be assured over time and possible combustible loading scenarios.

Chapter 4.0 Radiation Protection

RP-1 Section 4.1, pp. 4.1-1

Please explain the applicant's intent to comply with 20.1101(d).

Applicants must provide a radiation protection program that is adequate to protect the radiological health and safety of workers and members of the public in accordance with 10 CFR Part 20.

In Section 4.1 of the application, the applicant states that the radiation protection program meets the requirements of 10 CFR 20, Subpart B - Radiation Protection Programs. The applicant goes on to further outline its commitment to 10 CFR 20.1101(a-c), however, no specific information is provided with respect to 10 CFR 20.1101(d).

RP-2 Section 4.4.1, pp. 4.4-1

Please explain the qualifications for a "radiation specialist."

Applicants must provide a radiation protection program that is adequate to protect the radiological health and safety of workers and members of the public in accordance with 10 CFR Part 20 and 10 CFR 70.22(a)(6).

In section 4.4.1 of the application, the applicant states that, at a minimum, the Radiation Work Permit requires approval by a staff member who is a radiation specialist, however, there is no discussion of the qualifications of a "radiation specialist."

Chapter 5.0 Nuclear Criticality Safety

NCS-1 Section 5, General

For each process or equipment component that has Special Nuclear Material (SNM) associated with it, identify the amount, type, and location of fissionable material that will be present.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application.

The locations and descriptions of SNM to be used in the facility are needed to assess hazards.

NCS-2 Section 5.0, General

Clarify if you intend to commit to using the American Nuclear Society (ANS)-8 series of national standards for NCS that are applicable to the proposed facility or provide specific justifications for using alternative approaches.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application.

In Chapter 5.0, there needs to be a clear commitment to the requirements and recommendations of the appropriate ANS-8 series of national standards for NCS or justifications for using alternative approaches (e.g., there is no reference to ANS-8.22, "NCS Based on Limiting and Controlling Moderators" and ANS-8.23, "Nuclear Criticality Accident Emergency Planning and Response). The latest versions of the standards should be committed to (e.g., the application refers to ANS-8.1-1983, "NCS in Operations with Fissionable Materials Outside Reactors" instead of the most recent 1998 version). If no alternative approaches are provided, then the commitment needs to be to all the requirements and recommendations in the standards, rather than to some of the requirements and recommendations in the standards (e.g., Section 2.3.3 does not commit to all the requirements and recommendations of ANS-8.19, "Administrative Practices for NCS" and ANS-8.20, "NCS Training"). For guidance only, see NUREG-1520 Sections 5.4 through 5.4.2.

NCS-3 Section 5.1.1, p. 5.1-1; and Section 5.2.1.3.2, p. 5.2-3

Provide in Sections 5.1.1 and 5.2.1.3.2 a discussion of the 1.5 wt.% U-235 control limit on enrichment for the Contingency Dump System.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application.

A discussion of the 1.5 weight percent U-235 enrichment control limit for the Contingency Dump System is needed. Sections 5.1.1 and 5.2.1.3.2 describe an enrichment control limit of 5.0 weight percent U-235. However, the Contingency Dump System has an enrichment control limit of 1.5 weight percent U-235.

NCS-4 Sections 5.2, pgs. 5.2-1 - 5.2-5; 5.4, pgs. 5.4-1 - 5.4-3; and 5.3.16, pgs. 5.3-12 - 5.3-13

Clarify that the safety program in Chapter 5.0 includes all the programmatic commitments and descriptions of how to meet the commitments for the NCS program.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application.

For example, moderator control and mass control appear to be used but are not described in Section 5.4. For guidance only, see Chapter 5.0 of NUREG-1520 with emphasis on Sections 5.4.3.4.1, 5.4.3.4.2, and 5.4.3.4.4.

NCS-5 Section 5.2.1, p. 5.2-1

Clarify that the MONK8A code used for NCS calculations will be controlled under the Quality Assurance Program Description.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application. 10 CFR 70.65(d) requires the establishment of management measures to ensure compliance with performance requirements of 10 CFR 70.61.

NCS computer codes need to be controlled under the Quality Assurance Program to ensure that results are reliable and computer codes properly documented.

NCS-6 Section 5.4, General

Provide a discussion of criticality prevention using "enhanced administrative controls."

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application.

Sections 5.4.1, 5.4.2, and 5.4.3 provide discussions of criticality prevention using passive engineered controls, active engineered controls, and administrative controls. A discussion of criticality prevention using enhanced administrative controls is needed.

Chapter 6.0 Chemical Process Safety

CS-1 Table 6.1-2, p. 1 of 1

Describe the fire protection features associated with the storage of silicone oil and the means of preventing propagation of a fire involving this oil into an area containing UF_6.

10 CFR 70.22(a)(7) requires the applicant to provide a description of equipment and facilities which will be used by the applicant to protect health and minimize danger to life or property. In addition, 10 CFR 70.62(c)(1)(iii) requires that the ISA identifies facility hazards that could effect the safety of licensed materials and thus present an increased radiological risk.

Table 6.1-2 lists 560 liter and 70 liters of silicone oil in the UF_6 handling Area and Blending and Liquid sampling areas, respectively. The quantities of oil raise the concern of the potential heating and rupture of cylinders, piping, and manifolds containing UF_6.

CS-2 Table 6.1-5, p. 1 of 1

Provide an evaluation of a fire involving the diesel fuel stored outside for the standby electrical generators. Include in the evaluation the effects of the postulated fire on nearby IROFS or buildings containing IROFS and what fire protection measures are associated with the tanks. Provide a similar analysis for any other tanks containing diesel fuel including tanks in the central utilities building and the fire pump house.

10 CFR 70.22(a)(7) requires the applicant to provide a description of equipment and facilities that will be used by the applicant to protect health and minimize danger to life or property. In addition, 10 CFR 70.62(c)(1)(iii) requires that the ISA identifies facility hazards that could effect the safety of licensed materials and thus present an increased radiological risk.

Only two large diesel fuel tanks are identified in Table 6.1-5 and no fire protection provisions are identified. In regard to day tanks, the number and capacities are not provided, although the application states that sprinkler protection is provided in the fire pump house and central utilities building.

CS-3 Table 6.3-5

Provide a rational basis for adjusting acute chemical release limits through the use of a time-weighted average (TWA) method, and confirm that the proposed Acute Exposure Guideline Level (AEGL) values are based on the latest published figures.

10 CFR 70.65 (b)(7) requires that the ISA Summary contain a description of the proposed quantitative standards used to assess the consequences to an individual from acute chemical exposure to licensed material or chemicals produced from licensed materials.

Table 6.3-5, Enhanced Definition of Consequence Severity Categories, represents enhanced derived values as extrapolated from the HF and UF_6 (as soluble uranium) AEGLs. The table utilizes a 1-minute and 5-minute acute chemical exposure time for a local worker and a worker in the room, respectively, and a 30-minute exposure time for outside the controlled area. NUREG-1520, Section 6.4.3.1, Process Chemical Risk and Accident Sequences, notes that acute chemical release limits may not be adjusted by a TWA calculation unless a rational basis is provided in the ISA Summary. Use of an approach endorsed by an internationally recognized committee, such as contained in the National Academy of Sciences latest revision to the AEGLs (2004) would be acceptable.

Chapter 7.0 Fire Safety

FS-1 Section 7.3, pp. 7.3-1 through 7.3-5

Describe the fire protection features that protect the control room. Describe any potential release consequences that can result from a control room fire including potential releases from fire induced spurious actuations of motors, valves, etc.

10 CFR 70.22(a)(7) requires the applicant to provide a description of equipment and facilities that will be used by the applicant to protect health and minimize danger to life or property.

The discussion of facility design in the Section 7 on fire safety does not discuss the control room.

FS-2 Section 7.3, pp. 7.3-1 through 7.3-5

Describe the measures that will be employed to prevent or mitigate the effects of flammable gas explosions in the Chemical and Environmental laboratories.

10 CFR 70.22(a)(7) requires the applicant to provide a description of equipment and facilities which will be used by the applicant to protect health and minimize danger to life or property.

Table 6.1-4, Chemicals in the Technical Services Building and the staff's in-office review of Document L4-50-01, Fire Hazards Analysis for License Application, documented the existence or use of hydrogen in the chemical and environmental laboratories. However, the effects of an explosion are not evaluated in the Safety Analysis Report.

FS-3 Section 7.3.1, pp. 7.3-1 to 7.3-2

Provide the fire resistance classification of the facility buildings in accordance with Table 3-1 of National Fire Protection Association (NFPA) 220.

10 CFR 70.22(a)(7) requires the applicant to provide a description of equipment and facilities that will be used by the applicant to protect health and minimize danger to life or property.

The classifications provided by the applicant in section 7.3-1 are in accordance with the *New Mexico Building Code*. In order to evaluate the fire resistance of these buildings in accordance with the 10 CFR 70.61 performance requirements, the NFPA 220 classifications need to be provided.

FS-4 Sections 7.5.2.1, 7.5.2.2, and 7.5.2.3, pp. 7.5-5 to 7.5-6

Provide a more detailed description of the capabilities of the facility fire brigade and how it will be supported by the local fire departments.

10 CFR 70.22(a)(7) requires the applicant to provide a description of equipment and facilities that will be used by the applicant to protect health and minimize danger to life or property. In addition, 10 CFR 70.22(a)(8) requires the applicant to provide proposed procedures to protect health and minimize danger to life and property.

The description of the fire brigade in Section 7.5.2.1, should include the capabilities of the fire brigade in terms of the NFPA 600 classifications (incipient fire fighting, exterior fire fighting, advanced exterior fire fighting, interior and structural fire fighting, or advanced exterior and interior structural fire fighting). The description should also include the proposed size of the brigade, specify any mobile apparatus, or other equipment including hose lines available to the brigade.

Section 7.5.2.2 should describe the capabilities of the local fire departments with which a Memoranda of Understanding will be obtained. Response times, notification procedures, and any expected responsibilities of the on-site fire brigade should also be provided.

Section 7.5.2.3 should include the schedule for completion of the baseline needs assessment and an explanation of how this assessment may impact Section 7.5.2.

Chapter 10.0 Decommissioning

D-1 Section 10.1.3, pp. 10.1-1 and 10.1-2

Provide the increased level of detail described in NUREG-1757, Volume 3, for the decommissioning cost estimate.

The regulations in 10 CFR 70.25 require applicants for a uranium enrichment facility to have decommissioning funding plans. NUREG-1757, Volume 3, "Consolidated NMSS Decommissioning Guidance," specifically Chapter 4, Section 4.1, "Cost Estimate (As Contained in a Decommissioning Funding Plan or Decommissioning Plan)" provides the information and acceptance criteria that should be used in both developing and evaluating the decommissioning cost estimate. Appendix A, Section A.3.1, "Preparing the Site Specific Cost Estimate," provides specific guidance on the information to be included in the cost estimate for the staff to be able to make a finding regarding the adequacy of the cost estimate, and reasonable assurance regarding funding to support decommissioning.

The applicant's cost estimate for the facility is a summary of the decommissioning costs and is presented in Table 10.1-1, "Total Decommissioning Costs," and does not include the supporting basis for how the applicant arrived at the summary estimates for each activity. For the staff to evaluate the decommissioning cost estimate, the applicant needs to provide the level of detail described to NUREG-1757, Volume 3, Section A.3.1.

D-2 Section 10.1.3, pp. 10.1-1 and 10.1.2

Provide a thorough justification for using a contingency factor less than 25 percent.

The regulations in 10 CFR 70.25 require applicants for a uranium enrichment facility to have decommissioning funding plans. NUREG-1757, Volume 3, "Consolidated NMSS Decommissioning Guidance," specifically Chapter 4, Section 4.1, "Cost Estimate (As Contained in a Decommissioning Funding Plan or Decommissioning Plan)" has recommended a contingency factor of 25 percent.

The applicant is using a contingency factor of 10 percent and has based the reduced factor on past experience. While the staff agrees that a contingency factor lower than 25 percent may be warranted based on past experience at similar facilities, the applicant needs to provide a stronger supporting basis for a reduced contingency, and although a reduced contingency may be warranted, the staff believes 10 percent may not be sufficient. In addition, the staff believes that the contingency factor needs to be applied across the board, and includes applying the contingency factor to the cost of the tails disposition (also see Comment D-4).

D-3 Section 10.2.1, p. 10.2-1

Provide an unexecuted copy of the surety mechanism for decommissioning financial assurance.

The regulations in 10 CFR 70.25 require applicants for a uranium enrichment facility to have decommissioning funding plans. Decommissioning funding plans include a certification that financial assurance for decommissioning has been provided in the amount of a site-specific cost estimate and a signed original of the financial assurance instrument used. Under "Consolidated NMSS Decommissioning Guidance," NUREG-1757, it is acceptable to provide the executed surety instruments prior to the commencement of licensed activities or receipt of licensed material.

An unexecuted copy of the financial assurance instrument proposed to be used by the applicant needs to be reviewed to ensure that it meets the requirements in 10 CFR 70.25.

D-4 Section 10.3, pp. 10.3-1 through 10.3-3

Provide a contingency factor for the processing and disposal of depleted uranium. Also, provide copies of the four reports used to prepare the tails disposition cost estimates.

The regulations in 10 CFR 70.25 require applicants for a uranium enrichment facility to have decommissioning funding plans. Decommissioning funding plans include a certification that financial assurance for decommissioning has been provided in the amount of a site-specific cost estimate and a signed original of the financial assurance instrument used.

NUREG-1757, Volume 3, "Consolidated NMSS Decommissioning Guidance," specifically Chapter 4, Section 4.1, "Cost Estimate (As Contained in a Decommissioning Funding Plan or Decommissioning Plan)" has recommended a contingency factor of 25 percent. Chapter 10.3 estimates 132,942 MT of depleted uranium will be generated over the thirty-year life of the facility. The cost of waste processing and disposal cost for the depleted uranium is estimated to be $5.50 per MTU resulting in a total cost of $731,181,000. The cost was based on a comparison of four studies which were developed between 1993 and 2002 and the earlier studies were escalated to 2002 dollars. The cost for disposal of the depleted uranium varied significantly. Because the disposition of the depleted uranium may not take place for more than 30 years, and due to the uncertainty in the studies, LES needs to include a contingency factor in the estimated costs of disposition of the depleted uranium.

In Section 10.3, the applicant has prepared a cost estimate using four references. The staff needs these cost estimate references to evaluate the cost estimate basis.

Chapter 11.0 Management Measures

MM-1 Section 11.1, p. 11.1-1 through 11.1-12

Describe the Configuration Management (CM) process and controls that are in place during design, license application review, construction, and operation to assure that the design, engineering, procurement, and construction drawings and documents and the ISA are consistent and current.

10 CFR 70.72(a) requires that the licensee shall establish a configuration management system to evaluate, implement, and track each change to the site, structures, processes, systems, equipment, components, computer programs, and activities of personnel.

Section 11.1 states that the ISA will be under the CM program, but additional clarification of the design/procurement/construction and ISA interfaces and how the design basis is controlled and assured is needed to clarify the management measure adequacy in this area.

MM-2 Section 11.1.1, p. 11.1-1

Clarify what selective documentation is controlled by the CM program. Please amplify the scope of the selective documentation or identify documentation types that will be under the CM program and provide specific examples of documents that would not be under the CM program.

10 CFR 70.72(a) requires that the licensee shall establish a configuration management system to evaluate, implement, and track each change to the site, structures, processes, systems, equipment, components, computer programs, and activities of personnel.

Section 11.1.1.1 states that selective documentation is controlled under the CM program, but does not identify the documents, other than the ISA.

MM-3 Section 11.1.1.1, p. 11.1-3

Confirm that the scope of structures, systems, and components (SSC) under CM includes all SSCs and each change to them, and not just IROFS, and any items which may affect the function of the IROFS.

10 CFR 70.72(a) requires that the licensee shall establish a configuration management system to evaluate, implement, and track each change to the site, structures, processes, systems, equipment, components, computer programs, and activities of personnel.

Section 11.1.1.1 states that the scope of the SSCs under CM includes IROFS and any items which may affect the function of the IROFS.

MM-4 Section 11.1.5, p. 11.1-12

Confirm a commitment to ensuring comprehensive program oversight through audits and assessments of the CM program, initially and at least once every year in accordance with the Quality Assurance Program Description (QAPD) and Quality Assurance (QA) procedure requirements.

10 CFR 70.72(a) requires that the licensee shall establish a configuration management system to evaluate, implement, and track each change to the site, structures, processes, systems, equipment, components, computer programs, and activities of personnel.

The LES QAPD, Revision 0, Section 18, requires audits at least once per year, but does not address if the schedule will be adjusted annually upon evaluation based on an assessment of the applicable QA program elements. Section 11.1.5 states that periodic audits and assessments will be performed of the CM program, but does not identify a frequency.

EP-1 Section 3.1, pp. 3.1-1

Please explain the applicant's use of a fixed quantity of UF_6 (280kg) for use as a threshold for escalating an event from an Alert to a Site Area Emergency.

Regulations in 10 CFR 70.22(i) require certain applicants to provide emergency plans.

In Section 3.1 of the emergency plan, the applicant states that a release of approximately 280 kilograms (617 pounds) of UF_6 from the plant areas that house UF_6 has been established as the threshold for escalating an event from an Alert to a Site Area Emergency. NRC staff does not believe a fixed number is an adequate threshold to escalate an event to a Site Area Emergency due to the difficulty of determining the actual amount released during an actual emergency. A more reliable indicator of the need to elevate an event would be the visual indication of a white vapor cloud and its location. Furthermore, if a number is used, it should be based on reaching exposure limits for which an emergency plan is required, set forth in 70.22(i)(1)(i), and not those set forth in 70.61(b).

EP-2 Table 3.3-1

Please revise Table 3.3-1 to include the NRC as an agency to be contacted in the event of an emergency.

Regulations in 10 CFR 70.22(i)(3)(viii) require the applicant to provide a commitment to and a brief description of the means for notifying offsite response organization in the event of emergencies.

In Section 3.2.1 of the emergency plan, the applicant states the NRC will be notified within one hour of declaring an emergency, however, the NRC is not listed on Table 3.1-1, National Enrichment Facility Emergency Notification Form. The staff acknowledges that the applicant agrees to meet the requirement of 10 CFR 70.22(i)(3)(viii), but recommends the NRC be listed on Table 3.3-1, or that the information included in Table 3.3-1 be incorporated with NRC Form 361A (or a modified form of NRC Form 361A as appropriate for the specific facility), to aid the facility in meeting this requirement.

EP-3 Section 6.1, pp. 6.1-1

Please describe the documentation in the Security Building available to emergency operations personnel in the event that emergency operations are moved to this building, which has been designated as the planned alternate Emergency Operations Center (EOC).

Regulations in 10 CFR 70.22(i) require certain applicants to provide emergency plans. Sections 8.4.3.1.2(b) and (g) of NUREG-1520 discuss the need for adequate backup facilities and offsite resources that are ready to ensure timely mobilization.

In Section 6.1 of the emergency plan, the applicant states that the Control Room/Emergency Operations Center will contain current as-built drawings, procedures, and operational

engineering information to assist in emergency response. It is also stated that appropriate documentation will be available for use in the response to an event at the alternate offsite location. However, there is no information provided relating to documentation/information provided in the Security Building for emergency operation situations.